

AAO Foundation Award Final Report

Principal Investigator	Antonino G. Secchi, DMD, MS
Co-Investigator	
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Award Type	Orthodontic Faculty Development Fellowship Award
Project Title	3-Dimensional Morphometric Facial Analysis to Determine the Effects of Altering the Occlusal Vertical Dimension
Project Year	2006
Institution	University of Pennsylvania, Department of Orthodontics
Summary/Abstract (250 word maximum)	<p>The aim of this study was to analyze 3-Dimensionally the volumetric changes in lip and chin position when altering the vertical dimension. Pre-measured disarticulating rods were placed in the central groove of the mandibular first molars to increase the vertical dimension of thirty-five Caucasian females with ages ranging from 23-26 years old. The subjects were asked to bite down until initial occlusal contact with the rods. 3-Dimensional Digital stereophotogrammetry (3dMDface system, 3dMD Atlanta, GA) were taken to capture facial images at each altered vertical dimension as well as at centric occlusion. The imaged timepoints were as follows: (T1) first molars in normal occlusal contact, (T2) first molars separated approximately 0.8 mm., (T3) first molars separated approximately 2.6 mm., (T4) first molars separated approximately 3.1 mm, and (T5) first molars separated approximately 3.8 mm. 3-D data collection (3dMDvultus, 3dMD Atlanta, GA) of x, y, and z coordinates was processed and color-mapped to determine the amount of volumetric soft tissue change in response to altering vertical dimension at the first molar region. An increasingly greater volumetric change was seen at the areas subnasale, the lips, and the chin, respectively, with an increase in disarticulation. The chin area showed the greatest soft tissue volumetric changes, almost four times as much as the lips. The results of this research help to better understand the relationship between vertical dimension and soft tissue, and prove the value of 3-Dimensional digital photography as an emerging tool in orthodontics.</p>
Were the original,	Yes. The research was conducted and finished as planned. This study

<p>specific aims of the proposal realized?</p>	<p>not only helped us to understand the relationship between changes in vertical dimension and facial soft tissue, but also allowed us to start working with this 3D technology, which has been instrumental in the development of a series of other research projects in our department.</p>
<p>Were the results published? If not, are there plans to publish? If not, why not?</p>	<p>The manuscript was sent for publication to the AJODO. It was sent back with suggestions and correction to be made, which is the stage we are at.</p>
<p>Have the results of this proposal been presented? If so, when and where? If not, are there plans to do so? If not, why not?</p>	<p>The results of this proposal were presented at the 2007 University of Pennsylvania School of Dental Medicine Research Retreat.</p>